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Foreign Animal Disease Report

United States
Department of Agriculture

Emergency
Programs

Animal and Plant
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Veterinary Services



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This Issue

Emergency Programs Activities
Foreign Animal Disease Update
Screwworm Update
Bovine Spongiform Encephalopathy Update
Avian Influenza in Gamebirds in Maryland
Use of Alpha-Chloralose Restricted
Air Curtain Incinerator System Test for Disposal of Large Animal Carcasses

Emergency Programs Activities

Chief Staff Veterinarian. The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS), is pleased to announce the appointment of Dr. John L. Williams as chief staff veterinarian of Emergency Programs. Williams received his doctorate of veterinary medicine from Tuskegee University, Tuskegee, AL, in 1975. He joined APHIS in January 1978 and has held staff positions in Veterinary Biologics, the National Poultry Improvement Plan, and the Swine Health Protection Program. Williams also served as the assistant area veterinarian in charge in Georgia from 1985 through 1988. He joined the Emergency Programs staff in 1988 and served as a senior staff veterinarian until assuming his current position in April 1994.

Field Investigations. During the first half of fiscal year (FY) 1994 (October 1, 1993–March 31, 1994), veterinary medical officers from USDA, APHIS, VS, and State departments of agriculture conducted 127 investigations of suspicious foreign animal diseases in the United States to eliminate the possibility that an exotic disease may have been introduced. These investigations included 24 for vesicular disease conditions, 21 for avian diseases in pet birds and poultry, 29 for encephalitic disease, 6 for mucosal disease, 19 for hemorrhagic septicemia, 1 for pox/lumpy skin disease, 5 for excessive acute death, 3 for myiasis/acariasis, and 19 for other miscellaneous disease conditions.

There were 36 investigations conducted in VS' Northern Region, 29 in the Southeastern Region, 41 in the Central Region, and 21 in the Western Region. All investigations were negative for foreign animal diseases or pests.

Foreign Animal Disease Training. A foreign animal disease diagnostician's seminar on ratites and exotic animals was held in Arlington, TX, March 14-18, 1994. The seminar, which was developed jointly between VS and USDA, APHIS, Regulatory Enforcement and Animal Care, addressed husbandry, diseases, and restraint of ratites and various exotic hoofstock. A total of 48 veterinarians attended.

The annual foreign animal disease diagnostician's training course was held May 2–13, 1994, at the National Veterinary Services Laboratories (NVSL), Ames, IA, and at the

Foreign Animal Disease Diagnostic Laboratories, Plum Island, NY. A total of 20 veterinarians received extensive training in the diagnosis of foreign animal diseases.

Foreign Animal Disease Update

This update consolidates into tables information from Office International des Epizooties (OIE) bulletins covering July through December 1993. Countries reporting disease outbreaks are listed below the appropriate disease heading (followed by the month/year of the report and total number of outbreaks reported for that time period). The notation "+" indicates that the presence of disease was reported without information on total number of outbreaks. Outbreak number followed by "+" indicates number of outbreaks as well as the presence of disease.

Foot-and-Mouth Disease

Virus Untyped

Bangladesh (4-6/93) +
Benin (1-6/93) 4
Bhutan (7&9-12/93) 6+
Brazil (5-9/93) 755
Chad (3-8/93) 1+
China (People's Republic) (6/93) 2
Ethiopia (2&3/93) 2
Hong Kong (8&9/93) 3
India (3&6-9/93) 345+
Iran (1-5/93) 252*
Laos (1-3/93) +
Myanmar (5-9&11/93) 11
Pakistan (3-9/93) 13+
Paraguay (8&10/93) 2
Sri Lanka (5&6/93) +
Thailand (1&5-11/93) 27
Vietnam (1-5/93) 53

* Incomplete total.

Virus O

Bhutan (9&10/93) 2
Bolivia (1,2,5&7/93) 5
Brazil (5-10/93) 56
Colombia (6-11/93) 39
Ecuador (6-8&10/93) 8
Egypt (5,6&8/93) 12
Ethiopia (3/93) 11
Hong Kong (10/93) +
Iran (1-6/93) 122+
Jordan (5&8/93) 4
Kenya (5,7&8/93) 3
Malaysia (peninsula) (6-11/93) 11
Nepal (5,6&8/93) +
Oman (2-10/93) 80
Pakistan (3&6-9/93) +
Peru (3-8/93) 53
Saudi Arabia (1-4&8-11/93) +
Sri Lanka (5-8/93) 14
Tanzania (1-3/93) 5
Thailand (1-6&8-11/93) 38
Turkey (6-11/93) 114

Virus A

Brazil (5-10/93) 75
Colombia (6-11/93) 23
Ethiopia (3/93) 2
Iran (4&6/93) +
Kenya (9/93) 1
Pakistan (3&6-9/93) +
Peru (4/93) 1
Saudi Arabia (1-3&10/93) +
Tanzania (1&2/93) 4
Thailand (10&11/93) 2

Virus C

Bolivia (1,2,5&7/93) 7
Nepal (8/93) +

Virus SAT 2

Kenya (6&10/93) 3
South Africa (8/93) 1

Virus Asia 1

Cambodia (11/93) +
Thailand (1-11/93) 38

Vesicular Stomatitis

Virus Untyped

Panama (7-9/93) 5

Virus Indiana

Colombia (6-11/93) 53
Costa Rica (1,8&10/93) 3
Ecuador (6/93) 1
El Salvador (4/93) 1
Guatemala (8&9/93) 3
Panama (7/93) 1

Virus New Jersey

Colombia (6-11/93) 96
Costa Rica (1-4,6&8-10/93) 13
Ecuador (5/93) 1
El Salvador (1,2,4-6&8-10/93) 72
Guatemala (1,3,7,9&10/93) 9
Honduras (1,2,4&7-9/93) 15
Mexico (6-9/93) 7
Nicaragua (1,8&9/93) 6
Panama (6-9&12/93) 5
Peru (2&6/93) 2
Venezuela (6/93) 1

Swine Vesicular Disease

Italy (10-12/93) 5

Rinderpest

Ethiopia (1&8/93) 3
India (3-9/93) 24
Oman (3&5/93) 3
Pakistan (6-9/93) +
Saudi Arabia (7/93) 1
Sri Lanka (1-6/93) 15
United Arab Emirates (3/93) 1

Bluetongue

Botswana (9&10/93) 2
India (3,8&9/93) 2
Israel (12/93) 5
South Africa (6,7,9&10/93) 2+
United States (5-9/93) +

Fowl Plague

Bangladesh (4-6/93) +
Nepal (4-6/93) +
Nigeria (5-8/93) +

Rift Valley Fever

Egypt (7/93) 1
Mozambique (7-12/93) +

African Horse Sickness

Mozambique (7-12/93) +
Senegal (5/93) 1
South Africa (6&7/93) +
Zimbabwe (12/93) 1

Newcastle Disease*Virus Not Characterized*

Albania (4,5,7&8/93) 12
Algeria (5/93) 1
Angola (9/93) +
Bangladesh (4–6/93) +
Benin (1–12/93) +
Bolivia (1,2&6/93) +
Brazil (5–8&10/93) 30
Cambodia (4–6/93) +
Chad (3–8/93) +
China (People's Republic)
(1–6/93) 160
Colombia (8&10/93) 2
Cote-d'Ivoire (6–9/93) +
Egypt (8/93) 2
Guinea (7,8&10/93) +
Hong Kong (5–7/93) 3
India (3–6,8&9/93) 541*
Iran (1–6/93) 298
Jordan (2–8/93) +
Macedonia (2/93) 1
Madagascar (1–3&6–9/93) 12
Malawi (4–8/93) 16
Malaysia (peninsula)
(7,8&10/93) 3
Mexico (7&9/93) 2
Mozambique (7–12/93) +
Myanmar (4–6,10&11/93) 9
Nigeria (7&8/93) +
Pakistan (3&8–10/93) 9
Philippines (8&9/93) +
Senegal (5/93) +
South Africa (6&7/93) 1+
Sri Lanka (1–6/93) +
Syria (1–9/93) 128
Tanzania (1,2,5&7–9/93) 38
Thailand (1–6/93) +
Tunisia (5–10/93) 63
Turkey (6–8&11/93) 13
United Arab Emirates
(1,2,6&9/93) 4
Vietnam (1–6/93) +
Zambia (4–11/93) +

* Incomplete total.

Velogenic Virus

Belgium (7–10/93) 28
Botswana (6–10/93) 25
Germany (7,8&11/93) 39
Indonesia (4–6/93) +
Kenya (7,8&10/93) 3
Korea (Republic) (6–8&10/93) 5
Luxembourg (8/93) 1*
Malaysia (peninsula) (7&8/93) 2
Nepal (4–6/93) +
Netherlands (1–3&6–11/93) 22
Russia (7&8/93) 2
South Africa (6–8,10&11/93) 37
Spain (11&12/93) 2
Sri Lanka (1–9/93) 157
Sudan (7&9/93) 2

* Pigeons.

Hog cholera

Belgium (10&11/93) 4
Brazil (6–9/93) 40
Bulgaria (5&6/93) 8
Cambodia (1–6/93) +
Chile (6–11/93) 10
China (People's Republic)
(1–6/93) 152
Colombia (6–9&11/93) 17
Croatia (9/93) 1
Cuba (10–12/93) 42
Czech Republic (9–11/93) 6*
Germany (6–11/93) 70
Hong Kong (5–8/93) 11
India (3–9/93) 54**
Italy (7&9–11/93) 6
Korea (Republic) (6–8/93) 15
Laos (1–3/93) +
Latvia (7&8/93) 2
Macedonia (2/93) 1
Madagascar (3,6&8/93) 4+
Mexico (8/93) 1
Myanmar (7/93) 1
Nepal (4–6/93) +
Philippines (5–9/93) +
Poland (12/93) 3
Russia (3,5–7&10–12/93) 19
Slovak Republic (12/93) 3
Sri Lanka (1/93) 1+
Switzerland (10–12/93) 4
Taipei China (7,10&11/93) 4
Thailand (1–6/93) +
Vietnam (1–6/93) 67

* Includes wild boars.

** Incomplete total.

Peste des Petits Ruminants

Benin (1–12/93) 54+
Cote-d'Ivoire (8/93) 1
Guinea (7–10/93) +
India (1&4–6/93) 6
Israel (Controlled Territories)
(8/93) 3
Jordan (5–9/93) 9
Mali (2/93) 1
Nigeria (5–8/93) 9
Oman (2–10/93) 129
Senegal (5/93) 4
United Arab Emirates (5/93) 1

Contagious Bovine**Pleuropneumonia**

Angola (6,7,9&10/93) 7
Benin (1–12/93) 7
Cote-d'Ivoire (6&8/93) 7
Ethiopia (3&7/93) 4
Guinea (7–10/93) +
Italy (8–10/93) 3
Kenya (5,7&8/93) 5
Mali (1–6/93) 10
Namibia (10&11/93) 2
Nigeria (5–8/93) 3
Tanzania (4/93) 1

Sheep and Goat Pox

Algeria (5–11/93) 196
Bangladesh (4–6/93) +
China (People's Republic)
(1&2/93) 2
Ethiopia (6&8/93) 6
India (3–9/93) 17+
Iran (1–6/93) 160
Israel (10/93) 2
Jordan (1,3,7&9/93) 4+
Libya (1–7/93) +
Mali (1&5/93) 2
Morocco (9–12/93) 13
Oman (2–8&10/93) 17
Pakistan (3–5/93) 6
Senegal (5/93) 5
Sri Lanka (4/93) +
Syria (2–4&8–10/93) 58
Tunisia (5–10/93) 82
Turkey (6–11/93) 67
United Arab Emirates (2,5&6/93) 3

African Swine Fever

Angola (7&9/93) 4
Italy (7–12/93) 35
Malawi (4–8/93) 17
Mozambique (8–12/93) +
Portugal (8/93) 3
Senegal (5/93) +
South Africa (10&11/93) 2
Spain (9–12/93) 7
Zambia (11/93) +

Lumpy Skin Disease

Bahrain (4/93) 6
Benin (1–3/93) 2
Ethiopia (2,4&6–8/93) 12
Kenya (9/93) 2
Madagascar (1–9/93) 79
Malawi (4–6/93) 18
Namibia (5–8&11/93) 15
Nigeria (8&10/93) +
South Africa (6&7/93) +
Zambia (4–9&11/93) +
Zimbabwe (7–12/93) 49

(Dr. Rob Tanaka, International Services [IS], APHIS, USDA, Hyattsville, MD 20782, 301-436-8892)

Screwworm Update

Mexico. All eradication activities regarding the introduction of screwworm into Mexico have ceased. Mexico is now again considered free of screwworm.

Belize and Guatemala. Both countries are considered free of screwworm. All program activities ceased as of the end of June 1994. As with Mexico, responsibility for monitoring and surveillance of screwworm will pass to these host countries.

El Salvador. The latest case originating in El Salvador occurred on March 4, 1992. Inspection activities continue at livestock markets where imported animals are sold. Sterile-fly dispersal continues at these market areas to prevent the possibility of reintroduction of screwworm. Program activities will continue until Honduras and Nicaragua are considered free.

Honduras. Sterile-fly releases began November 15, 1991. Currently, 115 million sterile flies are released per week.

Nicaragua. Sterile-fly dispersal began on July 12, 1993. Nicaragua is the farthest country from the United States currently in an operational program. Eradication of screwworm in Nicaragua will be significant because that country exports infested livestock to countries both north and south of its borders. About 70 million sterile flies are released weekly in Nicaragua.

Panama. A cooperative agreement was signed with the Government of Panama on February 11, 1994. This action is the first step in establishing a permanent barrier at the Darien Gap in Panama. Panama is the southernmost country where screwworm eradication is planned.

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Bovine Spongiform Encephalopathy Update

Surveillance of Domestic Animals in the United States. From the onset of the Bovine Spongiform Encephalopathy (BSE) Surveillance Program in May 1990 through June 1994, 1,622 bovine brain specimens were submitted for examination by NVSL and other laboratories. All of the samples were negative for histopathologic evidence of BSE. To enhance APHIS' ability to detect BSE in the United States, agency officials are reviewing a program to improve the quality of data obtained from domestic BSE surveillance submissions.

Surveillance of Cattle Imported from the United Kingdom. In July 1989, APHIS placed a ban on the importation of ruminants from countries where animals are infected with BSE. However, import records indicate that, from 1981 until the date of the ban, 492 cattle were imported from the United Kingdom into the United States. Epidemiologic tracebacks indicate that, as of July 25, 1994, 135 of these U.K. imports were known to be alive in the United States, 216 were known to be dead, and 141 animals are being traced through breed associations. In addition, 7 imports have been exported to Mexico or Canada. APHIS is conducting an assessment to determine the probability of identifying a BSE-infected animal among the U.K. imports.

In Canada. On December 7, 1993, APHIS, VS, was notified by Agriculture Canada that BSE was confirmed in a cow brain submitted to the Airdrie Animal Health Laboratory in Alberta, Canada (Foreign Animal Disease Report, Number 22-1). In response to this finding, Agriculture Canada destroyed and incinerated the infected cow, her five imported U.K. herd mates, her four natural offspring, her seven embryo transfer off-

spring, and the remaining U.K. cattle imported into Canada during the interval 1982 to 1990, except for one Charolais bull. The acquisition of this bull is pending legal action in Canada. In addition, Agriculture Canada depopulated the herd of 269 cattle in which the infected animal resided, including its 1993 calf crop. Approximately 10 offspring of the British imports whose dams were determined to come from infected herds in the United Kingdom are also being depopulated.

OIE has determined that Canada will retain its BSE-free status. In addition, USDA has taken no action regarding importation of cattle and bovine products from Canada. However, the Food and Drug Administration (FDA) issued a letter to manufacturers of human drug, biologic, radiological health, and medical device products regulated by the agency requesting that the manufacturers not use bovine-origin materials from cattle that have resided in or originated from countries designated by USDA as BSE infected.

(Dr. Sara Kaman, Emergency Programs, VS, APHIS, USDA, Hyattsville, MD 20782, 301-436-8073)

In Europe. Between March 4 and June 3, 1994, Great Britain had 7,335 newly confirmed cases of BSE, with 961 more herds affected. About 51.2 percent (up from 49.3 in the previous quarter) of the dairy herds and 13.3 percent (up from 12.5) of the beef suckler herds in Great Britain have been affected (table 1). The incidence of newly identified cases of BSE in Great Britain continues to decrease (fig. 1).

In the same 3-month period, 99 additional confirmed cases of BSE were reported from Northern Ireland, while the Republic of Ireland and Switzerland had 4 and 14 cases, respectively. Germany identified one case in an imported animal. France's three new cases were in domestic animals (table 2).

[Source: Dx Monitor, Animal Health Report, Summer 1994, VS, APHIS, USDA, 555 South Howes, Suite 200, Fort Collins, CO 80521]

Table 1—Descriptive epidemiological statistics for BSE in Great Britain* as of June 3, 1994

Total number of confirmed cases	128,601
Total number of affected herds	30,620
Percentage of dairy herds affected	51.2
Percentage of beef suckler herds affected	13.3

* England, Scotland, and Wales.

Table 2—Other countries affected by BSE

Country	Imported cases	Native cattle	Cases	Date of last report
Canada	Yes	No	1	15 Dec 93
Denmark	Yes	No	1	10 Aug 92
Falkland Islands	Yes	No	1	4 Sep 92
France	No	Yes	9	26 May 94
Germany	Yes	No	2	3 Jun 94
Northern Ireland	Yes	Yes	1,317	1 Jun 94
Oman	Yes	No	2	31 Jul 92
Portugal	Yes	No	1	5 Nov 93
Republic of Ireland	Yes	Yes	90	1 Jun 94
Switzerland	No	Yes	78	1 Jun 94

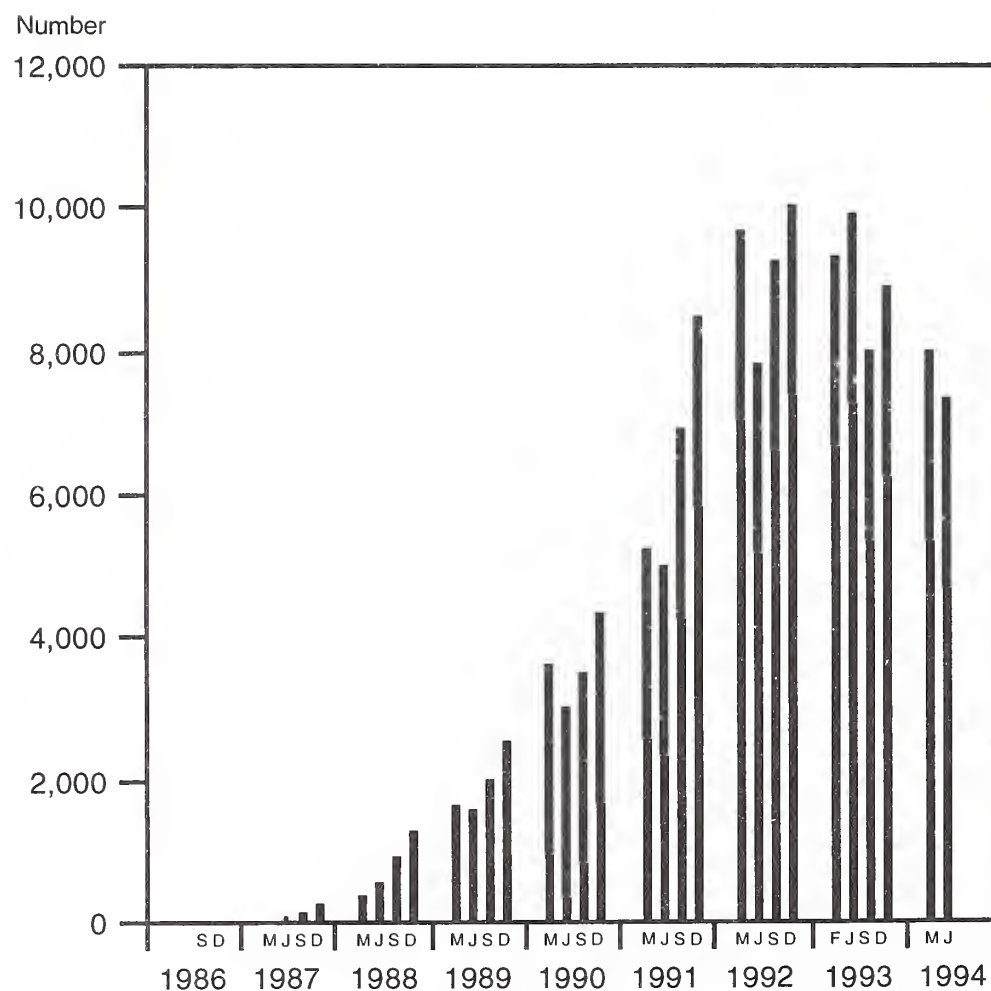


Figure 1—Number of new cases of BSE in Great Britain, September 1986–June 1994
(F=February, M=March, J=June, S=September, D=December).

Avian Influenza in Gamebirds in Maryland

In November 1993, three subtypes of avian influenza (AI) were isolated from pheasants and waterfowl on a large gamebird farm in Centreville, MD. State and federal officials initiated an investigation when the owner began losing about 100 pheasants per day. NVSL confirmed the isolation of a nonpathogenic H5N2 AI virus from samples taken from the premises. The diagnosis was of particular concern because Centreville is within the Delmarva Peninsula, which has an extensive broiler industry.

In 1983 and 1984, another outbreak of highly pathogenic H5N2 AI in Pennsylvania, Maryland, New Jersey, and Virginia resulted in the destruction of 17 million birds. Eradication efforts cost taxpayers nearly \$65 million and contributed to the rise of poultry prices by approximately \$349 million in just 6 months. In addition, Brazil, Canada, and Japan restricted poultry imports from the United States. In the 1993 outbreak, the nonpathogenic virus was found only on the gamefarm; it was not detected in any commercial poultry flocks in the area.

The pheasants and other gamebirds were raised under semiwild conditions for eventual release as game on shooting preserves. Epidemiologists speculate that the flock may have become infected through contact with wild Canada geese that landed in the area in September 1993. Migrating waterfowl may act as reservoirs of nonpathogenic strains of AI. In fact, the virus that was isolated on the Maryland gamefarm was determined to be identical to a strain of AI found previously in wild waterfowl.

Although the virus was nonpathogenic to commercial poultry, it had the potential to become more virulent through genetic mutation. Thus, a reservoir of virus could have provided an opportunity for the emergence of more pathogenic viral strains and could have caused serious disease if introduced into a commercial poultry flock.

With approval by the Governor of Maryland, State officials depopulated the entire flock. In response to Maryland's request for assistance, APHIS provided laboratory support, disease expertise, and personnel for the depopulation taskforce.

(Dr. Christopher Groocock, Emergency Programs, VS, APHIS, USDA, Hyattsville, MD 20782, 301-436-8073)

Use of Alpha-Chloralose Restricted

For many years, wildlife biologists have used the hypnotic drug Alpha-Chloralose (A-C) to capture wild turkeys, Canada geese, ducks, and other species for relocation and for various research projects. A-C has been particularly valuable in wild-turkey restoration programs. The drug also has been useful as a humane method to control nuisance species, such as feral pigeons, and to depopulate flocks of diseased waterfowl. In such cases, A-C has been used at lethal dosages.

Although until recently A-C could be purchased and used with little restriction, this is no longer the case. FDA has become increasingly concerned about noncompliance with the agency's regulations on drug use in animals. The USDA, APHIS, Animal Damage Control (ADC) program sought FDA registration to use A-C for capturing waterfowl, coots, and pigeons. This authorization was issued under an Investigational New Animal Drug Agreement. With this authorization, FDA has placed strict controls on the procurement and use of A-C: Only ADC personnel who have completed specialized training and received APHIS certification can legally use A-C, and its use is restricted to waterfowl, coots, and pigeons. A-C can no longer be administered in lethal quantities: diseased birds or nuisance birds must be tranquilized with A-C and then euthanized. Other species of animals may be added to the list in the future, and

individuals with other agencies may be certified to acquire and use A-C, but USDA's Pocatello Supply Depot will continue to be the only source of A-C for research or development. Wildlife biologists who need to use A-C should contact their respective State Director for ADC, or the Pocatello Supply Depot at 208-236-7820.

(Source: SCWDS Briefs, vol. 9, no. 4, January 1994, Southeastern Cooperative Wildlife Disease Study, College of Veterinary Medicine, The University of Georgia, Athens, GA 30602, 706-542-1741)

Air Curtain Incinerator™ System Test for Disposal of Large Animal Carcasses

Introduction. Concentrations of animals at slaughter affected with a zoonotic disease pose a risk to food processors, and many methods of disposal of such carcasses are detrimental to the environment. Carcass disposal methods need to be safe, effective, and environmentally acceptable. Such methods are important in the event of a domestic zoonotic disease where human exposure is a consideration or in the event of an introduction of a foreign animal disease where animal byproducts in the food chain would pose a threat to domestic livestock.

Discussion. High-temperature incineration may provide a method of disposal that is effective, prevents the spread of disease, and is environmentally acceptable. This method of incineration may be an alternative to other traditional disposal methods, such as rendering, burial, and open burning.

In May 1994, the Emergency Programs staff and the Louisiana Department of Agriculture field-tested a patented air disbursement manifold system for total incineration of large swine and bovine animal carcasses. The test involved the Air Curtain Incinerator, a completely self-contained, portable unit designed to destroy trees and other wood material in a safe, controlled burning process.

The Air Curtain Incinerator is powered by a diesel engine that drives a 15,000 ft³/min centrifugal caged fan. Air is forced out restricted outlets along an adjustable 15- to 35-ft-long manifold. Airspeed can be adjusted up to 165 mi/h, depending on the need. The airflow is forced across the top and angled downward into a trench or pit. The curtain of air acts as a top for the incinerator and provides oxygen that produces high burn-temperatures. Temperatures produced by the unit, depending on the fuel source, range from 1,800 to 2,800 °F. The 360-°F air rotating in the burn trench results in an increased oxygen flow and creates an afterburner effect, similar to an exhaust scrubber on a smokestack. The recirculating air under the top air curtain provides enough time for organic compounds to burn completely with little smoke or ash escaping into the air above.

An additional fuel source is critical for maintaining high burn-temperatures. The fuel source is maintained by the addition of wood to the incineration trench as needed. The incineration trench can range from 6 to 10 ft deep, 8 to 10 ft wide, and 15 to 35 ft long. Front-end loader type equipment is necessary to add the wood and large animal carcasses safely to the incineration pit.

Test Location. Carcasses from brucellosis-infected and -exposed swine located on a premises near Jena, LA, were used to test the system. Contractual arrangements were made with the owner of a Model T-359 Air Curtain Incinerator in Baton Rouge, LA, to transport the equipment to the site. Arrangements were made with the swine owner and local road-maintenance personnel to incinerate the carcasses on the premises.

Pit Preparation. An incineration trench approximately 10 ft wide, 30 ft long, and 8 ft deep was prepared. The trench was in a clay-type soil, which, although wet from several days of rain, allowed the construction of vertical walls without the danger of collapse. Initially, approximately 4 1/2 cords of dry hardwood (oak and gum) in 5-ft lengths were placed loosely in the pit. The Air Curtain Incinerator's diesel engine and fan were set up 25 ft from the incineration pit and perpendicular to it. The air curtain manifold was in a 25-ft configuration and was placed along the edge of the side of the incineration pit. The manifold was connected to the fan by four 5-ft sections of metal pipe. This pipe delivers air to the center of the manifold, where it is spread to each side and delivered across and into the trench by the restricted outlets along the length of the 25-ft manifold.

Testing the Air Curtain Incineration Process. Diesel fuel was used to initiate wood burning. The Air Curtain Incinerator was started at a low speed until the wood was burning completely. Gradually, the airflow was increased until there were hot flames and no smoke or ash escaped from the pit. Initially, one 250-lb sow carcass was added to the burn pit. Approximately 15 min elapsed before the carcass was completely incinerated.

The remaining hogs were added to the pit a few at a time by use of a front-end loader, approaching from behind the manifold. This method provided protection for the operator and equipment from the heat and from possible collapse of the pit wall. The hogs burned rapidly, with the fat vaporizing and adding energy to the burning process. During the incineration process, little or no smoke or ash was emitted. Thirty-four hogs weighing approximately 225 lb each were completely burned in less than 3 h. One 850-lb cow was added to the pit and incinerated in less than 1 h. One and one half cords of wood were added to complete the incineration process. The amount of airflow was adjusted from time to time to keep the incineration process going smoothly. Examination of the ash revealed no traces of bones or teeth after the incineration.

Conclusions. The Air Curtain Incinerator system would likely be adequate to dispose of average-size swine herds, small cattle herds, and moderate-size poultry flocks, and the mobility of this system is a great benefit over other carcass disposal methods. However, this system may not be adequate to handle large cattle or swine herds or large poultry flocks. Incinerating these animals might be accomplished with multiple units; however, setting up multiple units on a premises may not be practical. The need to add combustible fuel to the units would also limit the usefulness of this process. Swine carcasses seem to burn more readily than cattle carcasses, probably due to the vaporization of swine fat adding fuel to the process. High-moisture carcasses such as poultry would likely require more energy to incinerate.

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